CC-B: SUPPLEMENTAL CAPITAL CONSTRUCTION REQUEST
FY 2007 - 08

Department Name: Revenue
Division Name: Motor Carrier Services Division
Project Name: Ft. Morgan EB POE Lane and Scale Pit
Project Phase: Phase 1 of 1
Risk Management I.D. No.

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State Controller Project No. P-

Executive Director Approval: **Date:** __/__/____
OSPB Approval: Lisa Esgar **Date:** 12/10/07____

1. Criteria.

(a) Check One

- ❑ **Emergency**
- ❑ **New Data**
- ❑ **Technical**
- • **Unforeseen Contingency**

(b) Describe the criteria: The Department of Revenue has discovered that the scale pit in the eastbound scale lane at the eastbound Ft. Morgan Port of Entry facility is continuing to deteriorate, resulting in the scale pit wall being pushed against the scale deck. In reviewing the problem with Colorado Department of Transportation (CDOT) Bridge Engineering, the cause of the damage appears to be movement of the eastbound scale exit lane into the eastern most wall of the scale pit. The movement of the exit lane has caused the east wall of the scale pit to move inward far enough to bind against the scale deck, preventing accurate weighing of vehicles at this port.

This problem is characterized as an unforeseen contingency because the deterioration has worsened with little warning, and structural failure may be possible before a FY 2008-09 appropriation is available. This situation was originally identified in 2001, a repair was attempted in the form of expansion joints in 2005, and an additional temporary repair was performed as recently as June 2007. However, CDOT believes the problem will continue and worsen prior to the availability of FY 2008-09 funds. If the scale pit does fail, the eastbound side of the Ft. Morgan Port-of-Entry will need to be closed, resulting in a significant loss of revenue, and may compromise highway safety.

The Department is requesting $290,234 for this project of which $44,187 is capital construction funds exempt and $246,047 is HUTF "off-the-top" funding.

2. Long Bill Appropriation Tables

Appropriation from Long Bill: SB 07-239					
Line Item(s)	**Total**	**CCFE**	**CF**	**CFE**	**FF**
Original Long Bill Items					
N/A – no prior appropriation	*$0*				
Requested Revision of Long Bill Appropriation					
Line Item(s)	**Total**	**CCFE**	**CF**	**CFE**	**FF**
New Long Bill Items					
Ft. Morgan EB Scale Pit and approach lane repair	$290,234	$44,187		$246,047	

3. Justify the change from approved budget request and/or FPP:

This request does not change an earlier approved budget request or existing appropriation because it is a new project; however, justification for a supplemental appropriation at this time is as follows:

Project Description/History:

At the eastbound Ft. Morgan Port of Entry (POE), the underground concrete structure that houses truck weighing devices, called a "scale pit," is facing structural failure. The pit and scale lane need to be repaired if the port is to continue its statutory mandate to enforce federal and state size and weight regulations. Initial damage to the Ft. Morgan eastbound pit was documented in 2001 when pressure against the east wall of the eastbound pit caused the corners of the pit to "pop" (see attached photos). The pressure was believed to have been the result of concrete expansion in the exit lane. It was believed that the eastbound exit lane concrete was expanding during the summer months and pressuring the west scale pit wall, which pushed inward and popped the corners. Surface repairs were completed on the corners, but those repairs were cosmetic only. During the summer months of 2001, the eastbound scale pit wall (exit side) was binding against the scale deck in the late afternoon sun and heat. No repairs were considered or attempted and the interruption in service was limited.

Similar, but more severe damage was documented on the westbound Ft. Morgan scale pit and lanes. In 2001, the westbound pit and lanes were demolished and rebuilt, with new grading and drainage systems installed.

In February 2005, CDOT was contacted for additional evaluation of the eastbound scale pit. In the opinion of the CDOT engineers, no significant wall movement or failure had occurred in the tension rebar of the scale pit. However, they reported that two additional simultaneous problems were observed. First, as trucks pull onto the scale and stop, the deck experiences a loading tension from west to east (the deck shifts). Conversely, as trucks accelerate off and away from the pit, the acceleration of the tires actually pushes the lane back into the east put will. Second, the east wall is experiencing pressure or tension which is being exerted from the expansion of the exit lane concrete due to heat.

In an attempt to alleviate pressure being exerted against the scale pit wall the concrete exit slab was cut and the expansion joints referenced above were installed from July to August 2005. The expansion joints have provided temporary relief from the binding. CDOT engineers were again consulted and analyzed the scale and lane pictures, determining that the proximate cause of the horizontal pressure is a combination of the truck loading in an eastbound direction and the westward expansion of the concrete exit lane into the pit wall. Though the recently installed expansion joint has provided temporary relief, the binding continues to occur, primarily because the exit lane was poured at the same width as the interior of the north and south walls of the pit instead of the exterior of those walls. Because the lane was poured at a narrower width, the horizontal movement of that lane will continue applying pressure at the weakest point of the scale wall (the center) and causes a bowing of the wall. CDOT's recommendation is to re-pour the lane to the wider width of the outside of the pit wall, lengthen the slabs and install sleeper slabs.

Steve Wernsman of Wernsman Engineering provided the design of the westbound scale pit in 2001. He concurs with the analysis of concrete movement in the entrance and exit slabs primarily as a result of truck movement (starts and stops). He agreed with the design recommended by CDOT (lane slabs with sleeper slabs).

CDOT engineers indicate that once the exit lane is redesigned and re-poured, the scale pit can be repaired by removing the upper portion of the east wall (approximately 3' deep by the full width of the pit) and re-pouring the pit at the same time as the lane is re-poured. It is believed that to begin repair of the scale pit, the scale deck must be removed. Because of the design and materials used, there is a likelihood of substantial damage to the deck in removal; therefore replacement of the deck is included in the plan.

The Department submitted a supplemental request to address the structural concerns in FY 2006-07. However, that request was not approved. Further deterioration and damage continue to occur and may worsen without supplemental funding.

Justification:

The pit and scale lane need to be repaired if the POE is to continue its statutory mandate to enforce federal and state size and weight regulations at this port. The projected is expected to cost $290,234.

In Colorado, the POE is the primary mechanism for ensuring commercial vehicle compliance with state and federal size and weight regulations. Funded through HUTF off-the-top appropriations, POE performs significant enforcement functions for the State, including commercial vehicle size and weight compliance, commercial vehicle safety and hazardous materials transportation standards, and commercial vehicle registration and drivers' licensing requirements. It is through the division's certified enforcement of size and weight laws that the Federal Highway Administration (FHWA) distributes highway funds to states. The State of Colorado and FHWA invests hundreds of millions of dollars to build and maintain highway infrastructure. Maintaining and preserving this infrastructure and controlling its rate of deterioration must be a critical component of this investment.

The Ports of Entry, within Motor Carrier Services (MCS) Division at the Department of Revenue, enforces laws concerning motor carriers and the owners and operators of motor vehicles, and assists motor carriers and the owners and operators of motor vehicles to comply with all tax laws, rules, and regulations pertaining to them. All POE weigh stations must be equipped with weighing equipment (CRS 42-8, *Port of Entry Weigh Stations*). Over 700,000 commercial vehicles in Ft. Morgan are weighed on fixed scales. Inoperability of those scales prohibits weighing. Failure to weigh commercial vehicles increases damage to pavement, increases safety risks, puts federal highway funding in jeopardy, and violates the statutory intent.

Colorado maintains ten permanent ports of entry throughout the State; most are open twenty-four hours a day. Subject to certain exceptions, every owner or operator of a motor vehicle or combination of vehicles having a manufacturer's gross vehicle weight rating or gross combination weight rating of 26,001 pounds or more must secure a valid clearance from a

POE weigh station (or from an office of the Department of Revenue or an officer of the State Patrol) before operating such vehicles or combination of vehicles on the public highways of the State (CRS 42-8-105, *Clearance of motor vehicles at port of entry weigh stations*).

As a reference, this is a steel reinforced concrete scale *deck,* which the trucks roll over. The *scale pit* is the structure underneath the surface that holds up the deck and contains the weighing mechanisms. The top edges of the pit are about 1 foot wide and surround the deck. The pit is approximately a 12-foot x 12-foot x 7-foot concrete "vault." The approach and exit lanes are 0% grade, bump free, concrete lanes, minimally 100' long constructed of 13" thick concrete slabs. It is recommended that these slabs be poured 45" long, at least 12" wide, located on sleeper slabs at all joints.

During June 2007, a steel scale deck was installed at the cost of over $10,500 to act as a temporary relief in the binding of the scale. The deck was designed and installed to fit into the scale pit opening in its current size, which is smaller than originally designed due to the lane movement and the existing scale pit damage. The design of the new deck allows it to be adjusted as the size of the pit continues to change. This fix was not intended to be a long term solution, but as a temporary fix until funds are appropriated for permanent repairs and replacement.

Estimated Project Timetable:

Timetable			
Phase	**Start Date(s)**	**Completion Date(s)**	**Remarks**
Physical Planning Phase	4/1/08	9/30/08	Timing, scheduling, engineering, planning, bidding, etc.
Construction Phase	10/1/08	04/30/09	Construction should be avoided in winter months, if possible.

Cost Assumptions:

The basis of the cost estimate is listed in the table below. The figures below are a compilation of two previous projects. Basic architectural and engineering costs have been increased over the FY 2006-07 supplemental request by the Denver-Boulder-Greeley CPI, while construction and infrastructure costs have been increased by the Colorado Construction Cost Index.

Estimates for this project were taken from a scale pit replacement project at the Monument port where estimates were reviewed and approved by two firms; Hallmark, Inc. a concrete construction firm; and Terracon, a geotechnical engineering firm. For this project, CDOT Bridge Design, who had previously participated in the design components of a similar project at the westbound Ft. Morgan POE, reviewed and modified the Monument estimates as necessary to conform to the particular conditions of this request.

Estimate for Ft. Morgan Port of Entry Scale Pit		
Description of Work		Amount
Construction		
	External vendor estimate – Scale Pit and Scale Deck	
1	Mobilization	11,836
2	Demolition	15,799
3	Structural excavation	11,520
4	Structural concrete scale pit repair	10,160
5	Structural backfill	8,504
6	Steel deck	25,380
7	Electrical	3,495
8	Drainage pipe	823
9	Commission scale	1,372
10	Bond	4,928
	CDOT estimate – Approach Lane	
11	*Concrete approach lane & sleeper slabs*	*81,280*
	SUBTOTAL (1)	175,097
Professional Services		
	External vendor estimate – Scale Pit and Scale Deck	
12	Geotech	3,612
13	Engineering	10,114
14	Material testing	6,089
15	Advertising	619
16	Code review	3,302
	CDOT estimate – Approach Lane	
17	*Scale approach lane design and plan preparation*	*65,016*
18	SUBTOTAL (2)	$88,752
19	**TOTAL 1 AND 2**	$263,849
20	Contingency @ 10%	$26,385
21	**TOTAL WITH CONTINGENCY**	**$290,234**

Operating Impact:

There are no additional operating expenses related to this request, however, there would be a reduction in revenue should the port become inoperable due to scale failure. In FY 2006-07 the port cleared 787,314 vehicles and collected $353,726 in revenue. Revenue collections may be down approximately $14,739 per month of construction ($353,726 ÷ 12 months ÷ 2 buildings).

4. Why is it necessary to have the appropriation prior to the Long Bill?

The urgency of the request is based on the risk of the scale pit breaking down which would result in the closure of the eastbound side of the Ft. Morgan port. The need for an appropriation during the current fiscal year is further demonstrated in the alternatives below:

(1) **<u>Replace scale lane and repair the scale pit (recommended).</u>** Replacement of the scale lane is necessary because at the time the lane was constructed it was poured the same width as the interior of the scale pit instead of the exterior width. Currently, the narrow width of the approach lane has placed pressure at the weakest point of the eastern most pit wall. The pressure is increased as trucks approaching the scale stop on the lane, which moves that portion of the approach lane forward into the scale wall. The scale wall has sustained damage by being pushed in, which has ultimately caused the pit wall to bind against the scale deck. Replacement of the approach lane will require dowelled expansion joints with the recommendation of attaching the approach lane slabs to 'sleeper slabs' at regular intervals. This design is recommended to prevent movement of the lane in any direction.

Additional damage to the scale pit wall is documented in the attached photos. The photos demonstrate the narrow approach lane, which has pushed the east wall into the scale deck. The movement is shown in one photo where the steel bracket is clearly bent, and the expansion joints at the pit wall have moved. Additional photos show that the corners of the pit wall have "popped" due to the pressure. One picture further shows that on the exit side of the pit the steel bracket has been pushed east, again popping the concrete on the opposite side of the pit. In reviewing the attached pictures it is readily apparent that the east wall of the pit has been pushed against the deck, whereas the west side has maintained the standard clearance.

Repair to the pit is required to re-establish structural stability and appropriate clearances. Repair would necessitate demolition of the approach lane on the east side of the scale and excavating enough soil to expose the vertical concrete wall underneath. The upper portion of the pit wall would be removed and repaired. This repair would be costly and involved, but less expensive than replacement. A similar process was successfully completed on the Ft. Morgan westbound scale pit. Repair should be feasible and, such repair would extend the life of the existing scale pit.

(2) **<u>Do nothing (status quo – not recommended).</u>** Without replacement or repair, the approach lane will continue moving and applying pressure to the scale pit wall. The concrete wall will move and buckle, large pieces of the structure will begin to fall off, and trucks cannot be weighed. The Department will be unable to meet its statutory mandate to enforce federal and state size and weight laws, potentially threatening public safety. Further, the eastbound side of the Ft. Morgan port will forego revenue collections.

5. Does this request require revision of a prior appropriation? No. This is a new project

6. Attach a copy of a complete Form CC-C of the *original* request.

7. Attach a new completed Form CC-C (Element #1 only if there was a prior appropriation) to reflect this supplemental request.

8. Supplemental Requests Per SB 98-1331

a) Describe the urgency of the request

N/A – this is a regular supplemental request, rather than a SB 98-1331 emergency supplemental request. However, see numbers 3 and 4 above for description of urgency and additional justification.

b) List funds to be restricted: N/A